

Prior art:

In Newman et al., 5,132,282, epitaxial strontium titanate (not mixed Ba/Sr titanate as per New Claim 17) is grown on r-plane (or "plane {1102}") sapphire. (Col. 6, line 3), (not c-plane as per New Claim 10).

In Kashiwara et al., 5,572,052, PZT and PZLT layers are grown, sapphire being a suggested substrate; however, deposition of epitaxial barium titanate, strontium titanate or BST on sapphire are not shown or suggested.

In Kijima et al., 6,376,090, epitaxial PZT layers are grown, sapphire being a suggested substrate; however, deposition of epitaxial barium titanate, strontium titanate or BST on sapphire are not shown or suggested.

Azuma, 5,614,018 fails to show or suggest deposition of epitaxial layers.

There is no teaching or suggestion in the Tsuzumi abstract, JP 11031921, that the deposited layers are epitaxial.

Significance of the differences between the claimed invention and the prior art:

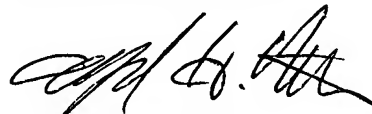
Regarding Claim 10, previously, strontium titanate had been grown on the r-plane of sapphire. The titanates to which the present invention is directed have a cubic structure, thus the tetragonal configuration of the r-plane is an apparent match for depositing epitaxial titanates of cubic structure. On the other hand, the c-plane is hexagonal and not an apparent lattice match for cubic titanates. In fact, in accordance with the invention, c-plane sapphire is found to be advantage for epitaxial growth, producing higher yield and improved performance.

Regarding Claim 17, the mixed oxide, barium strontium titanate, is a more complex oxide to deposit than strontium titanate, introducing an additional cation. Furthermore, the lattice structure of BST is changed in dimension relative to strontium titanate; accordingly, just because strontium titanate can be deposited epitaxially on sapphire, it would not be known that BST could be epitaxially deposited. BST has different electrical characteristics than strontium titanate and is therefore desired for certain electrical applications, particularly as a dielectric material.

For the reasons set forth above, an indication of Claims 10-25 as allowable is hereby requested.

August 13, 2004

Respectfully Submitted,



Alfred H. Muratori
Reg. No. 41,561
Customer number 24948